

Chapter 14

Personnel Contamination Reduction

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Chapter 14

Personnel Contamination Reduction

14.1 Introduction

Before a worker may enter any area of a site where potential exposure to hazardous substances exists, a decontamination procedure needs to be developed, communicated to employees and implemented. This chapter will outline measures for workers to take when leaving contaminated areas at hazardous waste sites. The intent is to preclude the chance of spreading contamination from personal protective equipment (PPE) utilized into clean areas, to avoid contaminant exposure to workers when doffing PPE, and to address the ultimate fate of PPE after use and removal (disposal or decontamination and re-use). All decontamination procedures utilized at hazardous waste sites must comply with 29 CFR 1910.120 of the OSHA Standard for Hazardous Waste Site Operations.

Contamination reduction procedures may vary among hazardous waste sites, depending upon the associated hazards. For example, after sampling a well contaminated with volatile organics, avoiding hand and skin contact is the primary control measure while doffing the PPE. Or if heavy metal contamination of soil is the hazard, then the careful removal of PPE without exposing personnel to particles and avoiding a respiratory hazard from airborne release are the main control measures.

Prior to entry the site history should be reviewed in order to anticipate the main contaminants of concern. These contaminants, plus the potential for unanticipated contaminants, will form the basis of the site Health and Safety Plan. This information should be considered when planning decontamination procedures for workers that will exit contaminated areas at the site.

The planning for, and the setting up of the decontamination area must occur prior to any entry into any exclusion zone or, contaminated areas of a hazardous waste site.

14.2 Steps In Doffing Disposable PPE

The procedures/methods depicted in the figures 14.1 through 14.5 show the order recommended for contaminant reduction personnel and for doffing personal protective equipment. These figures are taken from the, *NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*. Since the contamination hazards at hazardous waste sites vary greatly, the methods of decontamination may be adjusted by omitting, adding, or changing the stations identified to reflect the contamination hazards at a site. Once the order and method of decontamination and doffing equipment is established, is important that the method be followed by workers and monitored for its effectiveness to insure the prevention of contaminant spread and exposure to personnel.

As outlined in Chapter 4, *Site Entry Activities*, the hazardous waste site should have a designated contamination reduction zone. At this location, decontamination/backup personnel wearing the appropriate PPE, based on the chemical characteristics of the contaminants at the site. In general, the level of protection worn by decontamination personnel will be one level lower than that worn by exclusion zone entry personnel. For example, if entry personnel are wearing Level B PPE, then the decontamination personnel should employ level C as a minimum for their PPE.

Figure 14.1 Maximum Decontamination Layout, Level A Protection

Figure 14.2 Minimum Decontamination Layout, Level B Protection

Figure 14.3 Maximum Decontamination Layout, Level C Protection

Figure 14.4 Minimum Decontamination Layout, Levels A&B Protection

Figure 14.5 Minimum Decontamination Layout, Level C Protection

14.3 Doffing Reusable PPE

When reusable personal protective equipment is worn, it must either be decontaminated on site or carefully packed and transported for later decontamination. Full decontamination of reusable suits is usually accomplished in two steps. The first step is performed on line in the contamination reduction zone, using a cleaning solution that has previously been determined acceptable based on limited background knowledge of the site's suspected chemical, or biological hazards (see figures 14.1 through 14.5). After cleaning, the protective clothing is turned inside out, if possible, and sealed in plastic bags for return shipment.

If necessary, the second decontamination step is taken after the site's environmental samples have been analyzed and a more suitable decontamination solution for the clothing has been determined. Personnel wearing disposable safety clothing then perform this second cleaning. Depending on the types of contaminants present and their concentrations, waste decontamination solutions may need to be treated as a hazardous waste and disposed of accordingly.

14.4 Low Level Contamination

In many, if not most cases, site work may be conducted at sites where the contamination hazards have been determined not to warrant the use of respiratory protection. However, just because work at these sites is carried out in Level D PPE, it does not necessarily mean there is no contamination threat. Decontamination of personnel at sites with low levels of contamination, or having no exclusion zone activities, is often overlooked. At Level D activity sites, decontamination should be provided for the following: washing of boots, or the removal and disposal of boot covers (booties); removal and disposal of disposable coveralls; removal and disposal of outer and inner gloves; and the washing of hands, arms and face prior to leaving the site, or taking any breaks for eating or, smoking.

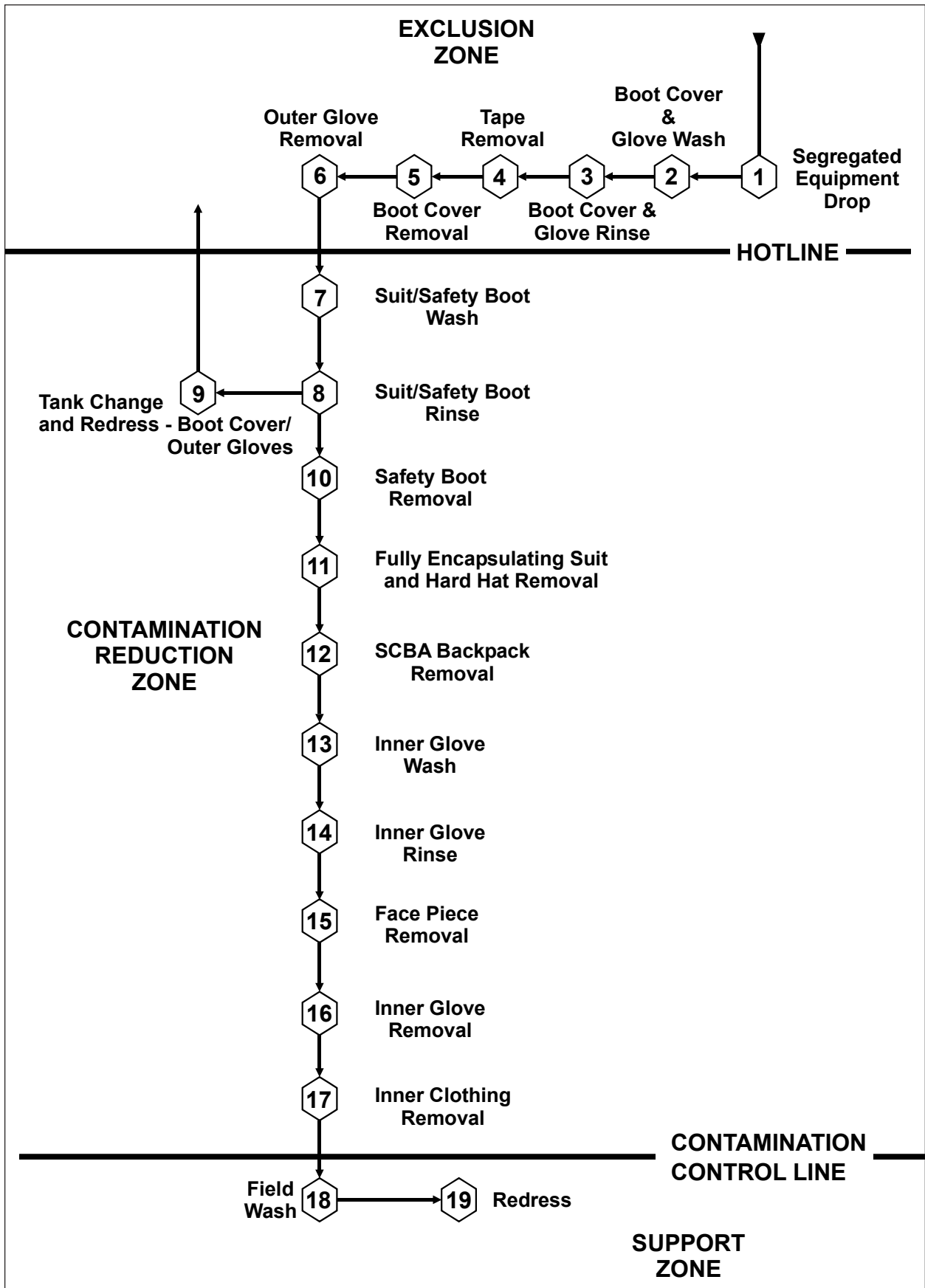


Figure 14.1 Maximum Decontamination Layout Level A Protection

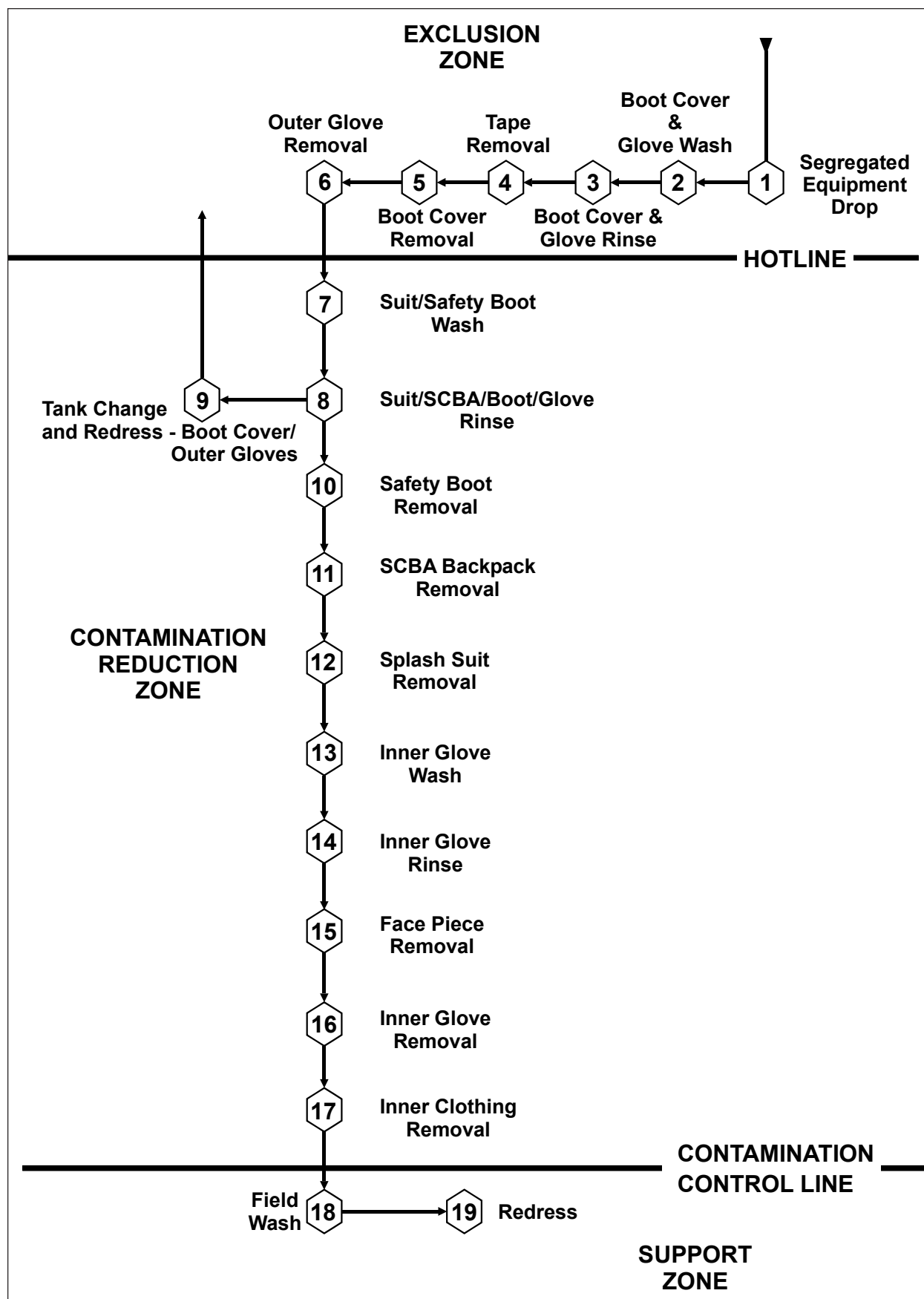


Figure 14.2 Maximum Decontamination Layout Level B Protection

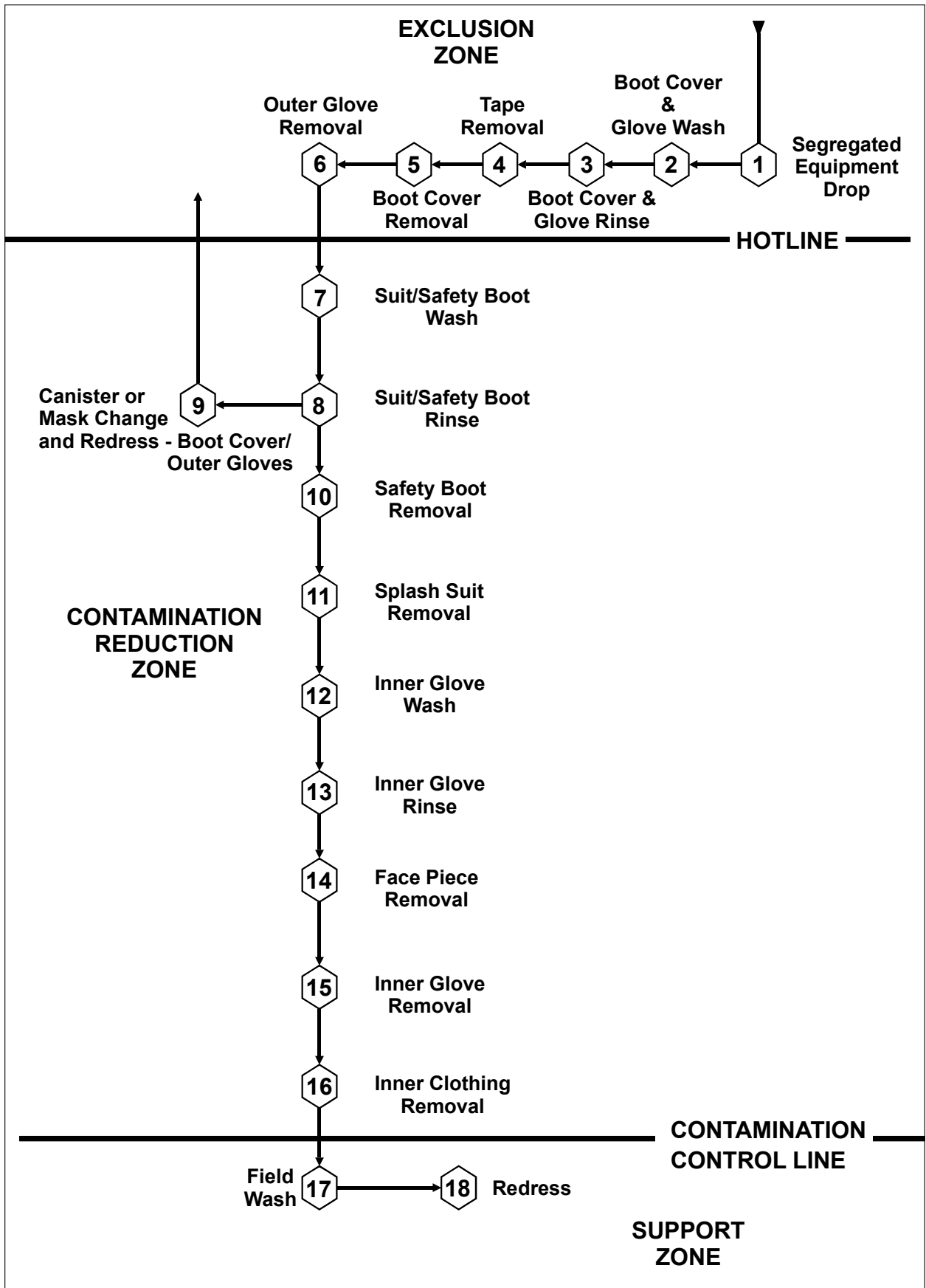


Figure 14.3 Maximum Decontamination Layout Level C Protection

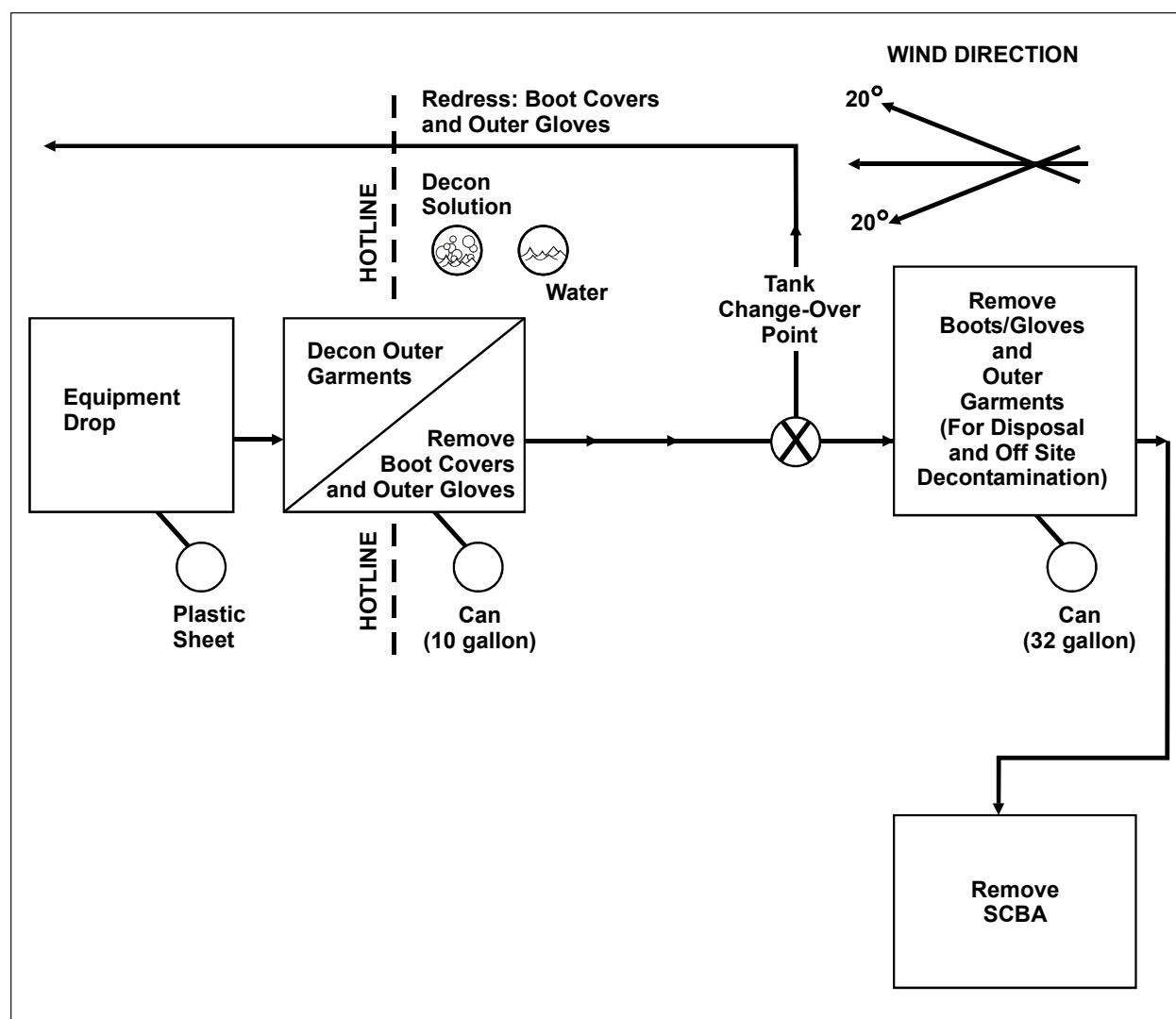


Figure 14.4 Minimum Decontamination Layout Levels A & B Protection

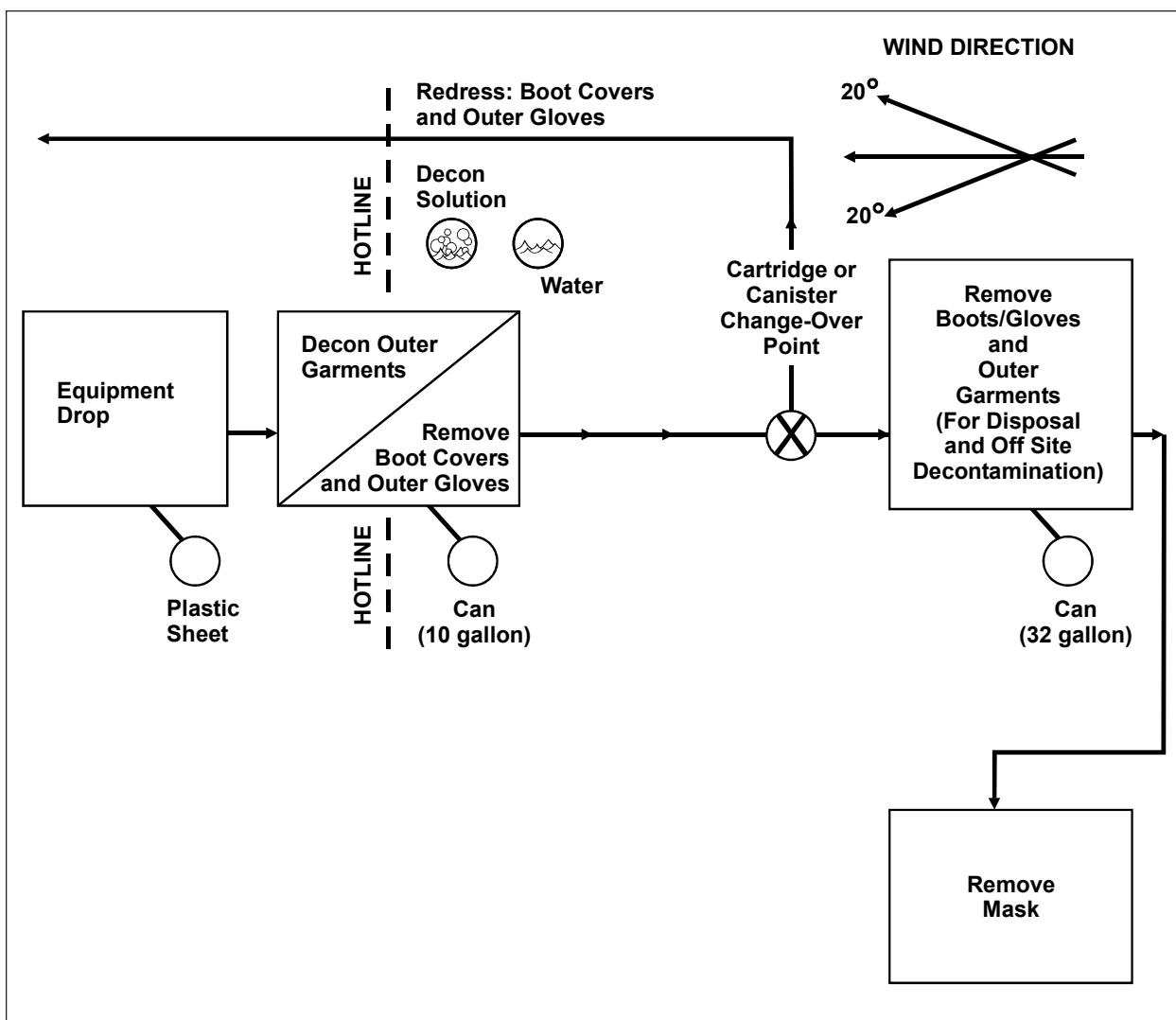


Figure 14.5 Minimum Decontamination Layout Level C Protection

References

NIOSH, OSHA, USCG, EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, DHHS (NIOSH) Publication No. 85-115, October, 1985.